

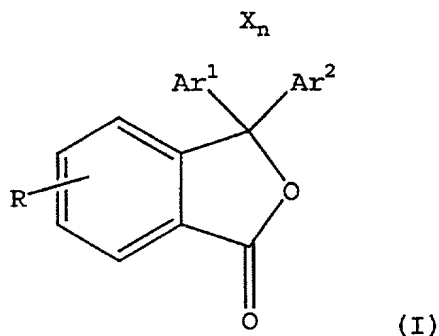
WHAT IS CLAIMED IS:

1. A radiation-curable fiber optic coating
composition for an inner primary coating,
5 comprising, in the uncured state, at least one
monomer or oligomer having a radiation-curable
functional group which can form free radicals in
the presence of actinic radiation, a
photoinitiator for said monomer or oligomer
10 present in an amount sufficient to effect
radiation cure of said monomer or oligomer, and a
coloring agent capable of imparting a pre-
selected color to the inner primary coating.
2. The coating composition of claim 1, wherein the
15 coloring agent is a dye or a dye precursor.
3. The coating composition of claim 2 wherein said
coloring agent comprises a substantially
colorless dye precursor capable of forming a
chromophore in said composition in the presence
20 of a cation, and a cationic photoinitiator, said
composition capable of curing to a pre-selected
color upon exposure to actinic radiation.
4. A substantially colorless radiation-curable fiber
optic coating composition for a member selected
25 from the group consisting of an outer primary
coating, a single coating, a buffering
composition, an ink composition, and matrix
materials which comprises, in the uncured state,
at least one monomer or oligomer having a
30 radiation-curable functional group which can form
free radicals in the presence of actinic
radiation, a photoinitiator for said monomer or

00370482-050101

oligomer present in an amount sufficient to effect radiation cure of said monomer or oligomer, a substantially colorless dye precursor capable of forming a chromophore in said composition in the presence of a cation, and a cationic photoinitiator, said composition capable of curing to a pre-selected color upon exposure to actinic radiation.

5. The fiber optic coating composition of claim 4 wherein said composition is an outer primary coating composition.
6. The fiber optic coating composition of claim 4 wherein said composition is a matrix material composition.
7. The fiber optic coating composition of claim 4 wherein said composition is an ink composition.
8. The fiber optic coating composition of any one of claims 3-7 wherein said dye precursor is a dye of the formula:



wherein X is oxygen or $-NR^1$;

n is 0 or 1;

R is hydrogen, alkyl, aryl, alkoxy, aryloxy, amino, alkylamino, arylamino or amido;

R^1 is hydrogen, alkyl or aryl;

Ar¹ and Ar² may be the same or different and are unsubstituted or substituted aryl or unsubstituted or substituted heterocyclic aryl, and when n=0, Ar¹ and Ar² may be fused or unfused.

- 5 9. The fiber optic coating composition of claim 8/
wherein at least one of Ar¹ and Ar² is substituted with an amino group of the formula -NR²R³, wherein R² and R³ may be the same or different and are hydrogen, alkyl or aryl.
- 10 10. The fiber optic coating composition of anyone of claims 8-9, wherein at least one of said Ar¹ and Ar² is substituted with said -NR²R³ group at the 4 or 4' position.
11. The fiber optic coating composition of any one of
15 claims 2-10 wherein said dye precursor is an isobenzofuranone.
12. The fiber optic coating composition of anyone of claims 2-10 wherein said dye precursor is a phthalide.
- 20 13. The fiber optic coating composition of anyone of claims 1-12 wherein said coloring agent is selected from the group consisting of
- 25 2'phenylamino-3'-methyl-6'(dibutylamino) spiro-[isobenzofuran-1(3H), 9'-(9H)-xanthen]-3-one; 2'-di(phenylmethyl)amino-6'-(diethylamino) spiro (isobenzofuran-1(3H), 9'-(9H)xanthen)-3-one; 6'-(diethylamino)-3'-methyl-2'-(phenylamino) spiro isobenzofuran-1(3H), 9'-(9H)xanthen)-3-one; 6-(dimethylamino)-3,3-bis(4-dimethylamino)phenyl-
- 30 1(3H)-isobensofuranone; and 3,3-bis(1-butyl-2-methyl-1H-indol-3-yl)-1-(3H)-isobenzofuranone.

09870482.050101

14. The fiber optic coating composition of anyone of claims 1-13, wherein said composition includes at least two different dye precursors.
- 5 15. The fiber optic coating composition of anyone of claims 3-14 wherein said cationic photoinitiator is selected from the group consisting of azonium salts, iodonium salts, sulfonium salts, selenium salts, pyrilium salts, N-alkoxy pyridinium salts, N-alkoxy isoquinolinium salts, phosphonium salts, arsonium salts and ferrocenium salts.
- 10 16. The fiber optic coating composition of claim 15 wherein said cationic photoinitiator is selected from the group consisting of aryldiazonium salts, diaryliodonium salts, triarylsulfonium salts, dialkylphenylarylsulfonium salts, dialkyl-4-hydroxyphenylsulfonium salts and triarylselenium salts.
- 15 17. The coating composition system comprising a plurality of coatings in which a first coating comprises a dye as a coloring agent, and in which the same, or a coating exterior to the coating comprising the coloring agent, comprises a stabilizer package to protect the dye in said composition.
- 20 18. The coating composition of claim 17 wherein said stabilizer package comprises an antioxidant.
- 25 19. The coating composition of claims 17-18, wherein said stabilizer package comprises at least one member selected from the group consisting of UV light stabilizers and UV light absorbers.
- 30 20. An optical fiber coated with the coating composition according to anyone of claims 1-19.

FOI 2009-08402850

21. A fiber optic comprising a plurality of coating layers, wherein a first coating comprises the composition of anyone of claims 1-16 and in which the same, or a coating exterior to the first primary coating comprises a stabilizer package to protect the coloring agent in said first coating.
22. The fiber optic of claim 21 wherein said stabilizer package comprises, in the uncured state, an antioxidant.
23. An optical fiber ribbon assembly comprising a plurality of optical fibers and a matrix material, wherein at least one of said optical fibers is a coated fiber according to any one of claims 20-22.
24. The coating composition of anyone of claims 1-19 wherein said coloring agent is a reactive dye or dye precursor.
25. The coating composition of claim 24 wherein said reactive dye or dye precursor includes ethylenic unsaturation.
26. The coating composition of claim 25 wherein said reactive dye or dye precursor includes an acrylate or a methacrylate group.
27. A radiation-curable fiber optic coating composition for a member selected from the group consisting of an inner primary coating, an outer primary coating, a single coating, a buffering composition, an ink composition, and matrix materials which comprises, in the uncured state, at least one monomer or oligomer having a radiation-curable functional group which can form free radicals in the presence of actinic

- radiation, a photoinitiator for said monomer or oligomer present in an amount sufficient to effect radiation cure of said monomer or oligomer, and a coloring agent, wherein said coloring agent comprises at least one reactive dye or dye precursor and said dye or dye precursor includes ethylenic unsaturation.
28. The fiber optic coating composition of claim 27 wherein said reactive dye or dye precursor is selected from the group consisting of polymethine dyes, diarylmethine dyes, triarylmethine dyes, aza analogues of diarylmethine dyes, aza annulenes, nitro dyes, nitroso dyes, azo dyes, anthraquinone dyes and sulfur dyes.
29. The fiber optic coating composition of anyone of claims 27-28 wherein said ethylenic unsaturation is of an acrylate or methacrylate.
30. The fiber optic coating composition of anyone of claims 27-29 wherein said coating composition is an inner primary coating composition.
31. The fiber optic coating composition of anyone of 27-29 wherein said coating composition is an outer primary composition.
32. The fiber optic coating composition of anyone of claims 27-29 wherein said coating composition is a matrix material.
33. An optical fiber coated with the coating composition of anyone of claims 27-32.